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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,957	08/17/2001	Koichi Ui	900-398	2405

23117 7590 03/27/2006

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EXAMINER

ZERVIGON, RUDY

ART UNIT PAPER NUMBER

1763

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/930,957

Applicant(s)

UI ET AL.

Examiner

Rudy Zervigon

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12 and 14-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12 and 14-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: The specification identifies the physical dimension for sheet resistance as " Ω/\square ". The " \square " dimension remains unrecognized.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 12, and 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oda et al (USPat. 5,252,132) in view of Ellis (USPat. 5,487,784). Oda teaches Claim 12 - A production apparatus of a film, comprising: means for heating a substrate comprising silicon - Support for this portion of claim 12 is found in the specification in paragraph [0053]. Specifically, the specification teaches "any known methods can be used". Oda teaches a heater (12). As such, Oda teaches an equivalent apparatus that performs the function of heating a substrate (2). As a result, Oda's prior art element 12 for heating performs the identical function of heating the substrate in substantially the same way, and produces substantially the same results as the corresponding elements disclosed in the specification (MPEP 2183). Oda's heater (12) heats the substrate to a predetermined temperature (column 8; lines 1-15). Applicant's claim 12 requirement of "comprising silicon" is an intended use claim requirement. It is well established that apparatus claims must be structurally distinguished from the prior art (In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does

Art Unit: 1763

.(emphasis in original) *Hewlett - Packard Co . v. Bausch & Lomb Inc .*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990), MPEP – 2114). Further, a claim containing a “recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus” if the prior art apparatus teaches all the structural limitations of the claim. *Exparte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

Oda further teaches means for positioning a bottom end of a discharge port of the first dispersion head (“former dispersion head”) closer to a surface of the silicon substrate than is a bottom end of the second dispersion head (“latter dispersion head”) - Support for this portion of claim 12 is found in paragraph [0076], [0098]. Specifically, the specification teaches “In FIG. 4, a distance A from bottom ends of the discharge ports for the gaseous titanium compound and the atmospheric gas to the surface of the silicon substrate 1 was set to 4 mm, for example, and a distance B from a bottom end of the discharge port for the dopant element compound to the surface of the silicon substrate 1 was set to 14 mm, for example. The difference between A and B was 10 mm.”. Oda teaches that a distance from the bottom ends of any of the discharge ports (37a) of the dispersion heads (any of the plural nozzles 37) to a surface of the substrate (2) is variable and controllable (column 8, lines 17-28). As such, Oda teaches an equivalent apparatus that performs the function of providing a variable distance between Oda's dispersion head and Oda's substrate. As a result, Oda's prior art element of 37 for providing a variable distance between Oda's dispersion head and Oda's substrate perform the identical function of "means for positioning" in substantially the same way, and produces substantially the same results as the corresponding elements disclosed in the specification (MPEP 2183).

Art Unit: 1763

Applicant's claim 14 requirement of "...said means for positioning and means for conveying cause a titanium oxide film to be formed in a non-uniform manner so that a concentration of the dopant element in the film varies through a thickness of the film so that the concentration of the dopant element in the titanium oxide film is higher adjacent a surface of the substrate than at a location spaced further away from the surface of the substrate" is a claim requirement of intended use. It is well established that apparatus claims must be structurally distinguished from the prior art (In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does ." (emphasis in original) Hewlett - Packard Co . v. Bausch & Lomb Inc ., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990), MPEP – 2114). Further, a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). The Examiner believes that Oda's above detailed apparatus and means for film formation are capable of varying film thickness, to achieve uniformity, over the deposited substrate as discussed by Oda (column 8, lines 17-28). The Examiner believes it inherent that Oda's control means (column 8, lines 17-28) for uniform film deposition are capable of non-uniform film deposition. Oda further teaches that Oda's film is formed on the substrate (2; Figure 1) continuously in an open system ("openness" is inherent as substrate 2 must be entered and exited from Oda's "open system"; Figure 1,10) "by chemical vapor despoition under atmospheric pressure" is a claim requirement of intended use of the pending apparatus claims - Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205

Art Unit: 1763

USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

Oda further teaches:

- i. The apparatus of claim 12, further comprising means for a second pre-heating of the heated substrate after the film is deposited, as claimed by claim 16 – Applicant's second "pre-heating" is a verb, and the Examiner believes this falls under an intended use of the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter, 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

Oda does not teach conveyor means. Oda does not teach the distance/partitioned circumference from the bottom ends of his discharge ports to the surface of the substrate and the distance/partitioned circumference from the bottom end of the discharge port of another discharge port to the surface of the silicon substrate is 0.1 to 30 mm. Oda further does not teach the relative position between Oda's dispersion head and Oda's substrate surface where "the

Art Unit: 1763

concentration of the dopant element in the produced titanium oxide film becomes higher from the surface of the titanium oxide film to the surface of the silicon substrate”.

Oda further does not teach a partition (Applicant's 10; Figure 1) for surrounding a discharge gas between the latter dispersion head (any of the plural nozzles 37) and the silicon substrate, the partition being positioned below a circumference of bottom ends of the discharge port of the latter dispersion head (any of the plural nozzles 37).

Ellis teaches a continuous atmospheric pressure CVD device (Figure 1; column 5, line 60 – column 6, line 57) including conveyor means - Support for this claim limitation is found in lines 26-30, page 12 of Applicant's specification. Specifically, the specification teaches “..conveyor means is preferably constituted in such a fashion as to be capable of conveying the substrate from a position immediately below the discharge port of the discharge head for the dopant element compound through a position immediately below the discharge port of the dispersion head for the titanium compound in a gaseous state to the portion immediately below the discharge port for the atmospheric gas.”. Ellis teaches conveyor means (6; Figure 1) capable of conveying the substrate from a position immediately below the discharge port (30; Figure 1) of a discharge head (20; Figure 1) through an adjacent position. As such, Ellis teaches an equivalent apparatus that performs the function of conveying the substrate. As a result, Ellis's prior art element 6 for conveying the substrate perform the identical function of conveying the substrate in substantially the same way, and produces substantially the same results as the corresponding elements disclosed in the specification (MPEP 2183).

Ellis teaches a continuous atmospheric pressure CVD device (Figure 1; column 5, line 60 – column 6, line 57) including a partition (28; Figure 1) provided between the dispersion heads (20; Figure 1) and the silicon substrate (4; Figure 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Ellis's conveyor and partition to Oda's film deposition apparatus and for Oda to optimize the location and number of Oda's discharge ports relative to each other and to the substrate.

Motivation add Ellis's conveyor and partition to Oda's film deposition apparatus and for Oda to optimize the location and number of Oda's discharge ports relative to each other and to the substrate is to delimit film depositions as taught by Ellis (column 6; lines 9-13), and to provide for continuous throughput of Oda's semiconductor production as taught by Ellis (column 1; lines 40-59) respectively, further, motivation to optimize the location of Oda's discharge ports relative to each other and to the substrate is to control the concentration of reactant gases and to improve uniformity and thickness of the deposited film as taught by Oda (column 8, lines 17-28). Further, would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05). It is well established that the duplication of parts is obvious (In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04).

Response to Arguments

4. Applicant's arguments with respect to claims 16-19 have been considered but are moot in view of the new grounds of rejection.

5. Applicant's arguments based on the "openness" of Oda's apparatus is not persuasive. Oda's apparatus is just as "open" as Applicant's apparatus. Specifically, Oda's substrate (2) can be added and removed to Oda's apparatus just as readily as with Applicant's apparatus. Further, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

6. The remainder of Applicant's arguments is addressed in the body of the Examiner's rejections

Conclusion

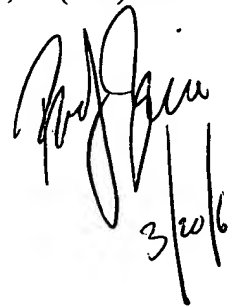
7. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 1763

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.



3/20/16